

58049-00003 Sequence Listing_ST25
SEQUENCE LISTING

<110> Park, Eun Jeong
Kim, Jang Seong
Jang, Jihoon
Yum, Jungsun
Chung, Soo-il

<120> Novel Detoxified Mutants of Escherichia coli Heat-Labile Enterotoxin

<130> 58049-00003

<140> US 10/088,202
<141> 2002-03-15

<150> PCT/KR99/00555
<151> 1999-09-15

<160> 6

<170> PatentIn version 3.5

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<212> DNA
<213> Artificial sequence

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<223> Primer

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<222> (1)..(52)

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<213> Escherichia coli

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<222> (1)..(18)

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Glu Ile Lys Arg Ser Gly Gly Leu Met Pro Arg Gly His Asn Glu Tyr
 35 40 45

Phe Asp Arg Gly Thr Gln Met Asn Ile Asn Leu Tyr Asp His Ala Arg
 50 55 60

Gly Thr Gln Thr Gly Phe Val Arg Tyr Asp Asp Gly Tyr Val Ser Thr
 65 70 75 80

Tyr Leu Ser Leu Arg Ser Ala His Leu Ala Gly Gln Ser Ile Leu Ser
 85 90 95

Gly Tyr Ser Thr Tyr Tyr Ile Tyr Val Ile Ala Thr Ala Pro Asn Met
 100 105 110

Phe Asn Val Asn Asp Val Leu Gly Val Tyr Ser Pro His Pro Tyr Glu
 115 120 125

Gln Glu Val Ser Ala Leu Gly Gly Ile Pro Tyr Ser Gln Ile Tyr Gly
 130 135 140

Trp Tyr Arg Val Asn Phe Gly Val Ile Asp Glu Arg Leu His Arg Asn
 145 150 155 160

Arg Glu Tyr Arg Asp Arg Tyr Tyr Arg Asn Leu Asn Ile Ala Pro Ala
 165 170 175

Glu Asp Gly Tyr Arg Leu Ala Gly Phe Pro Pro Asp His Gln Ala Trp
 180 185 190

Arg Glu Glu Pro Trp Ile His His Ala Pro Gln Gly Cys Gly Asn Ser
 195 200 205

Ser Arg Thr Ile Thr Gly Asp Thr Cys Asn Glu Glu Thr Gln Asn Leu
 210 215 220

Ser Thr Ile Tyr Leu Arg Glu Tyr Gln Ser Lys Val Lys Arg Gln Ile
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225 230 235 240

Phe Ser Asp Tyr Gln Ser Glu Val Asp Ile Tyr Asn Arg Ile Arg Asp
245 250 255

Glu Leu Met Asn Lys Val Lys Phe Tyr Val Leu Phe Thr Ala Leu Leu
260 265 270

Ser Ser Leu Cys Ala His Gly Ala Pro Gln Ser Ile Thr Glu Leu Cys
275 280 285

Ser Glu Tyr His Asn Thr Gln Ile Tyr Thr Ile Asn Asp Lys Ile Leu
290 295 300

Ser Tyr Thr Glu Ser Met Ala Gly Lys Arg Glu Met Val Ile Ile Thr
305 310 315 320

Phe Lys Ser Gly Ala Thr Phe Gln Val Glu Val Pro Gly Ser Gln His
325 330 335

Ile Asp Ser Gln Lys Lys Ala Ile Glu Arg Met Lys Asp Thr Leu Arg
340 345 350

Ile Thr Tyr Leu Thr Glu Thr Lys Ile Asp Lys Leu Cys Val Trp Asn
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Asn Lys Thr Pro Asn Ser Ile Ala Ala Ile Ser Met Glu Asn
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<212> DNA

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catttttttt attttattag catcgccatt atatgcaa atggcgacagat tataccgtgc 240

tgactctaga ccccgatg aaataaaacg ttccggaggt cttatgcca gagggcataa 300

tgagtacttc gatagaggaa ctcaaataaa tattaatctt tatgatcacg cgagaggaac 360

aaaaccggc ttgttcagat atgatgacgg atatgtttcc acttacctta gtttgagaag 420

tgctcactta gcaggacagt ctatattatc aggatattcc acttactata tatatgttat 480

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aatatatctc agggaatatc aatcaaaagt taagaggcag atattttcag actatcagtc      900
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acggaatcga tggcaggcaa aagagaaatg gttatcatta catttaagag cggcgcaaca     1140
tttcaggtcg aagtcccggg cagtcaacat atagactccc aaaaaaagc cattgaaagg     1200
atgaaggaca cattaagaat cacatatctg accgagacca aaattgataa attatgtgta     1260
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<213> Escherichia coli

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<220>
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Met Lys Asn Ile Thr Phe Ile Phe Phe Ile Leu Leu Ala Ser Pro Leu
1           5           10           15

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Tyr Ala Asn Gly Asp Arg Leu Tyr Arg Ala Asp Ser Arg Pro Pro Asp
20           25           30

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Glu Ile Lys Arg Ser Gly Gly Leu Met Pro Arg Gly His Asn Glu Tyr
35           40           45

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Phe Asp Arg Gly Thr Gln Met Asn Ile Asn Leu Tyr Asp His Ala Arg
50           55           60

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Gly	Thr	Gln	Thr	Gly	Phe	Val	Arg	Tyr	Asp	Asp	Gly	Tyr	Val	Ser	Thr
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Ser	Leu	Ser	Leu	Arg	Ser	Ala	His	Leu	Ala	Gly	Gln	Ser	Ile	Leu	Ser
				85					90					95	
Gly	Tyr	Ser	Thr	Tyr	Tyr	Ile	Tyr	Val	Ile	Ala	Thr	Ala	Pro	Asn	Met
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Arg	Val	Asn	Phe	Gly	Val	Ile	Asp	Glu	Arg	Leu	His	Arg	Asn	Arg	Glu
145					150					155					160
Tyr	Arg	Asp	Arg	Tyr	Tyr	Arg	Asn	Leu	Asn	Ile	Ala	Pro	Ala	Glu	Asp
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Gly	Tyr	Arg	Leu	Ala	Gly	Phe	Pro	Pro	Asp	His	Gln	Ala	Trp	Arg	Glu
			180					185					190		
Glu	Pro	Trp	Ile	His	His	Ala	Pro	Gln	Gly	Cys	Gly	Asn	Ser	Ser	Arg
		195					200					205			
Thr	Ile	Thr	Gly	Asp	Thr	Cys	Asn	Glu	Glu	Thr	Gln	Asn	Leu	Ser	Thr
	210					215					220				
Ile	Tyr	Leu	Arg	Glu	Tyr	Gln	Ser	Lys	Val	Lys	Arg	Gln	Ile	Phe	Ser
225					230					235					240
Asp	Tyr	Gln	Ser	Glu	Val	Asp	Ile	Tyr	Asn	Arg	Ile	Arg	Asp	Glu	Leu
				245					250					255	
Met	Asn	Lys	Val	Lys	Phe	Tyr	Val	Leu	Phe	Thr	Ala	Leu	Leu	Ser	Ser
			260					265					270		
Leu	Cys	Ala	His	Gly	Ala	Pro	Gln	Ser	Ile	Thr	Glu	Leu	Cys	Ser	Glu
		275					280					285			
Tyr	His	Asn	Thr	Gln	Ile	Tyr	Thr	Ile	Asn	Asp	Lys	Ile	Leu	Ser	Tyr
	290					295					300				
Thr	Glu	Ser	Met	Ala	Gly	Lys	Arg	Glu	Met	Val	Ile	Ile	Thr	Phe	Lys
305					310					315					320

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Ser Gly Ala Thr Phe Gln Val Glu Val Pro Gly Ser Gln His Ile Asp
 325 330 335

Ser Gln Lys Lys Ala Ile Glu Arg Met Lys Asp Thr Leu Arg Ile Thr
 340 345 350

Tyr Leu Thr Glu Thr Lys Ile Asp Lys Leu Cys Val Trp Asn Asn Lys
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Thr Pro Asn Ser Ile Ala Ala Ile Ser Met Glu Asn
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<212> DNA

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